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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/059,865	04/14/1998	RAVI IYER		8997

7590

07/09/2003

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EXAMINER

NGUYEN, THANH T

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 07/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/059,865

Applicant(s)

IYER, RAVI

Examiner

Thanh T. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 12-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Prosecution Application

The request filed on 4/17/03 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/059,865 is acceptable and a CPA has been established. An action on the CPA follows.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 12, 14-16, 18, 20-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Hideaki (J.P. Patent No. 06-295888).

Referring to figures 1-2, Hideaki teaches a method of manufacturing an integrated circuit comprising the steps of:

- a) forming features (13) on a substrate (11), the features protruding from the substrate to create creases adjacent to the features (see figure 1a),
- b) depositing a layer of non-dielectric material (15, polysilicon, see abstract) over the features and the creases,

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c) removing the layer of the non dielectric material (15), leaving stringers (15b, called undesirable residual) of the non dielectric material in the creases, and

d) converting the stringer of non-dielectric material (15b) in the creases into a dielectric material (see abstract).

Regarding to claims 14, 20, depositing a layer of silicon (15, polysilicon , see abstract) over the features and the creases (see figure 1a).

Regarding to claims 15, 21, etching a portion of the non-dielectric material (15, see figure 1b, and abstract).

Regarding to claims 16, 22, oxidizing the stringers (15b, see figure 2, and abstract).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13, 17, 19, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hideaki (J.P. Patent No. 06-295888) in view of Matsuoka et al. (U.S. Patent No. 5,391,508).

Hideaki teaches a method of forming a feature over the substrate, forming a polysilicon over the feature, etching the polysilicon to form a stringer, and oxidizing the

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stringer. However, Hideaki does not teach forming a gate electrode protruding from the substrate (in claims 13, 19), and nitridizing the stringer (undesirable residue) (in claims 17, 23). Nevertheless, forming a gate electrode protruding from the substrate, and nitridizing the stringer (undesirable residue) is known in the semiconductor processing art as evidenced by Matsuoka et al. Matsuoka et al teaches forming a gate electrode 103) protruding from the substrate (see figure 3a), and silicon nitride side walls may be used, rather than silicon oxide (see column 16, lines 10-15).

Therefore, it would have been obvious to one of ordinary skill in the requisite art at the time of the invention was made to provide silicon nitride sidewall by nitridizing process, in place of oxide sidewalls, in the Kim process, as taught by Matsuoka et al because it is shown that it is known in the art that silicon nitride function effectively as a sidewall and because silicon nitride is a better diffusion barrier and etch stop than silicon oxide and would therefore better protect the gate electrode and also the forming the gate electrode in order to form a FET device.

Conclusion

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Nguyen whose telephone number is (703) 308-9439, or by Email via address Thanh.Nguyen@uspto.gov. The examiner can normally be reached on Monday-Thursday from 6:30AM to 4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached on (703) 308-4940. The fax phone number for this Group is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956 (See MPEP 203.08).

A handwritten signature in black ink, appearing to read 'Thanh', with a stylized flourish extending from the end.

Thanh Nguyen
Patent Examiner
Patent Examining Group 2800

TTN